

The background image shows a cityscape at night. On the left, a hillside is covered with a series of white, rectangular buildings that are illuminated from within, creating a warm glow. To the right, a large, arched steel bridge spans a body of water. The bridge's structure is lit up, and its reflection is visible in the water. The sky is a deep blue with some clouds, and the overall scene is a mix of urban architecture and natural elements.

devscope

*Rui Romano*

# Power BI Hacks

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# Session Overview

- **Power BI Hacks**

- Modeling
- Extensibility
- Automation
- Governance
- DevOps



## **This session is not**

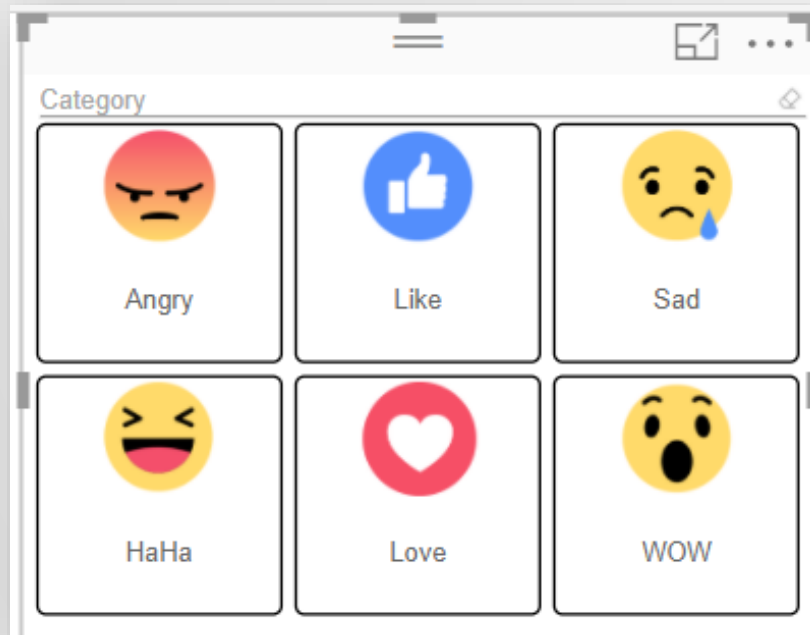
- Intro to Power BI
- Full of tips on DAX/M => [sqlbi.com](https://sqlbi.com)
- Deep-Dive on anything 😊

## **This session is**

- **Fast-paced**, full of demos
- Learn useful techniques

# Tip - Images as Base64

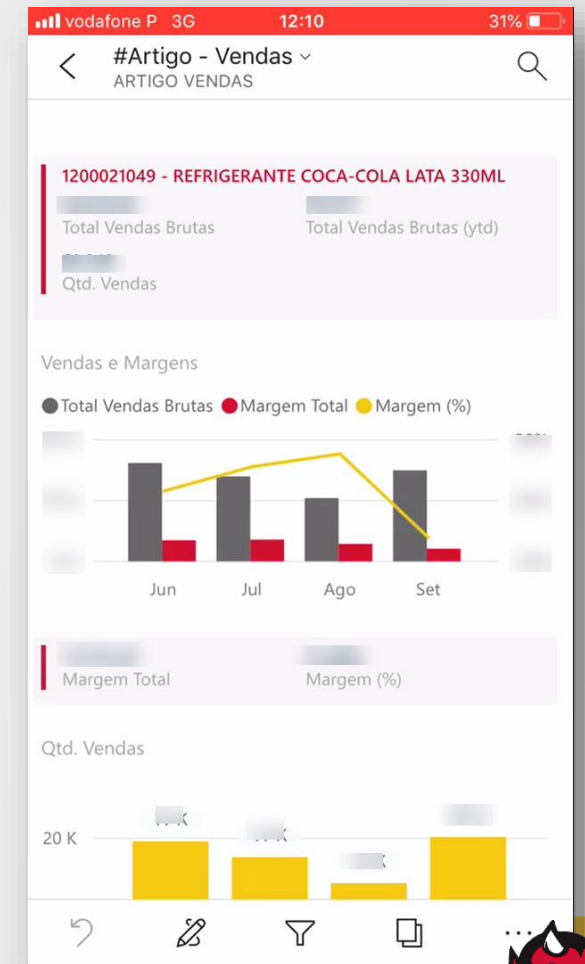
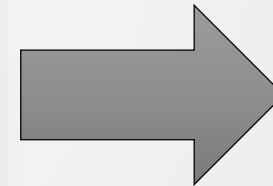
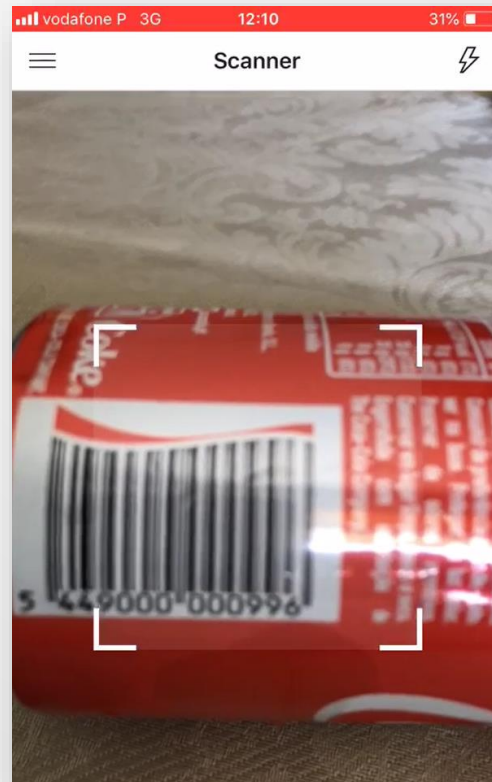
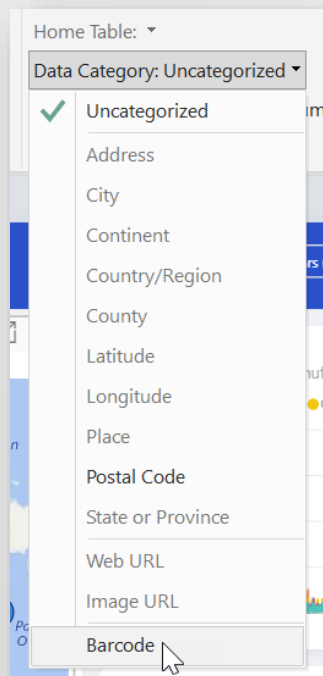
- Usefull for small images (ex: logo's)
- Dont need to store images on a website



Category	Image
Like	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAJIAAACF
Love	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAI8AAABH
WOW	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAJMAAACF
HaHa	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAJYAAACF
Sad	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAJEAAACF
Angry	data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAJJoAAACF

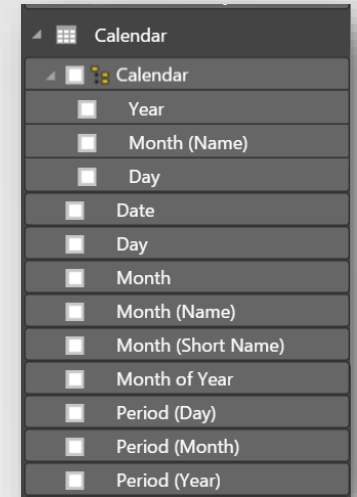
# Tip – Use the Barcode Scanner

- Little effort, **big impact**
- IOS only 😞
  - PowerApps



## Tip – Calendar/Date table

- Generate your calendar table with **M Script** or **DAX**
- Use Relative \*Period fields => Dynamic Filter Reports over Time

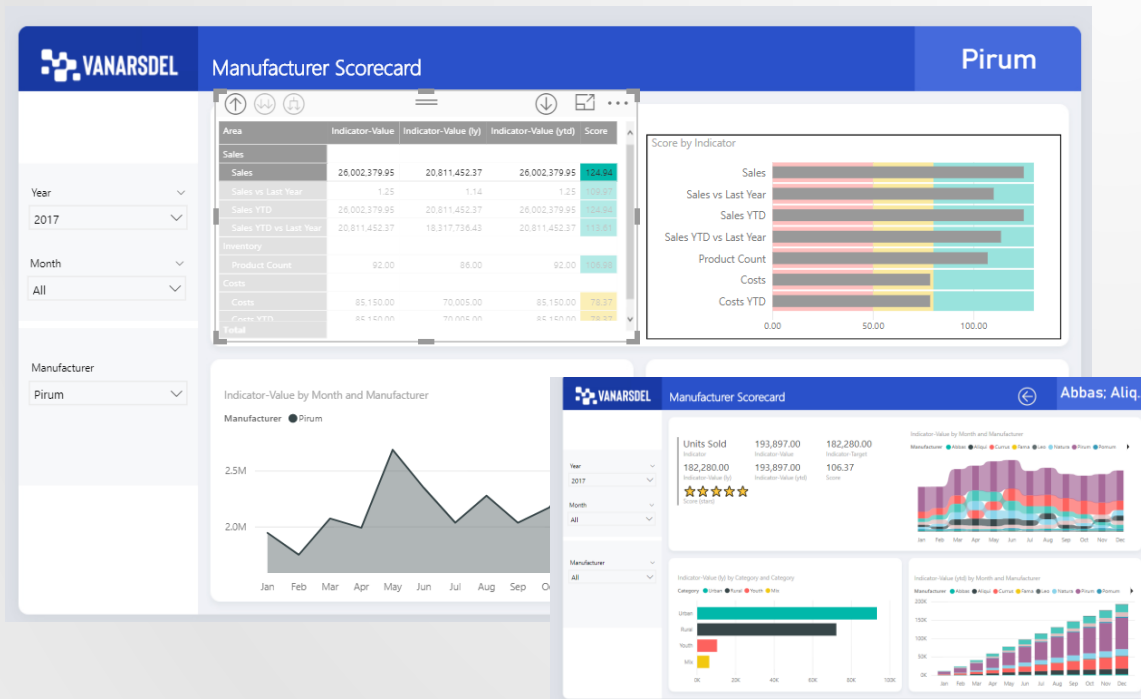
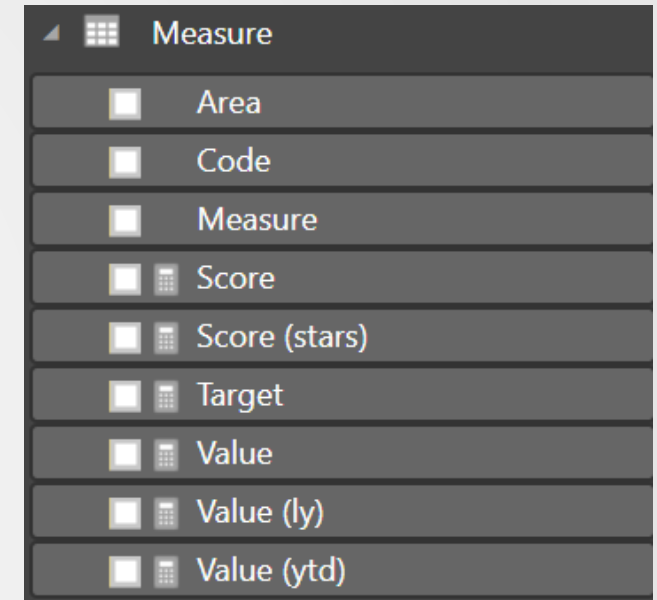


```
VAR TodayReference =
    TODAY () -- Change this if you need to use another date as a reference "current" day
VAR FirstYear = 2008
VAR LastYear =
    YEAR ( TodayReference )
VAR FiscalCalendarFirstMonth = 9 -- For Fiscal 52-53 weeks (start depends on rules) and Gr
VAR FirstDayOfWeek = 0 -- Use: 0 - Sunday, 1 - Monday, 2 - Tuesday, ... 5 - Friday, 6 - Sa
VAR IsoCountryHolidays = "US" -- Use only supported ISO countries or "" for no holidays
VAR WeeklyType = "Last" -- Use: "Nearest" or "Last"
VAR QuarterWeekType = "445" -- Supports only "445", "454", and "544"
```



# Tip – Measures as Dimension

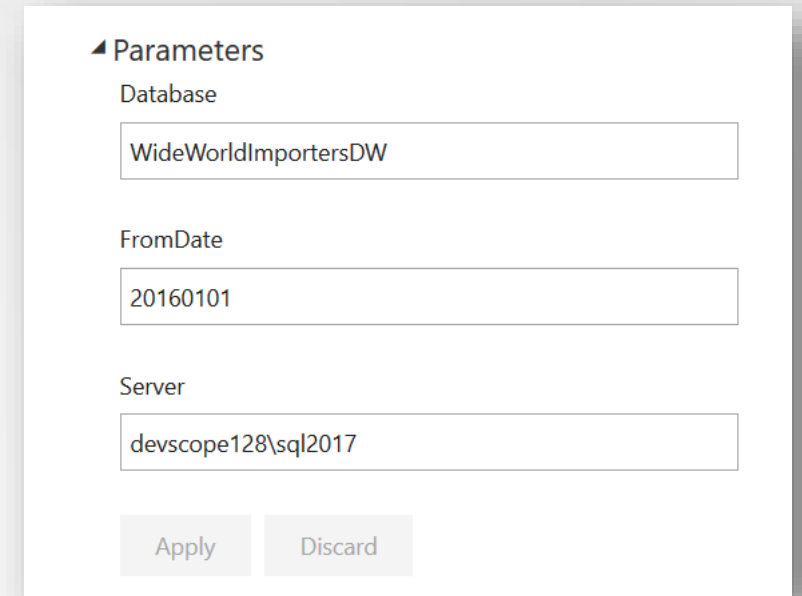
- One dashboard for multiple measures
- Build Scorecards
- Reusability: YTD, LY,... over all the measures
- \*Performance hit



```
Value =
if (HASONEVALUE('Measure'[Code]) && ISFILTERED('Measure'[Measure]),
var currentIndicator = SELECTEDVALUE('Measure'[Code],BLANK())
return |
SWITCH(currentIndicator
, BLANK(), BLANK()
, 1, [Sales]
, 2, DIVIDE([Sales], [Sales (py)])
, 3, [Units]
, 4, CALCULATE([Sales YTD], SAMEPERIODLASTYEAR('Date'[Date]))
, 10, DISTINCTCOUNT('Sales'[ProductID])
```

# Tip – Parameters

- Scenarios
  - PBIX Templates
  - Change the values after Publish
    - Change the Database without Re-Publish
    - Change the Query without Re-Publish
- Set the Type (don't use “Any”)
- Change values on **UI** or [REST API](#) (PS)
  - Set-PBIDatasetParameters



Parameters

Database

WideWorldImportersDW

FromDate

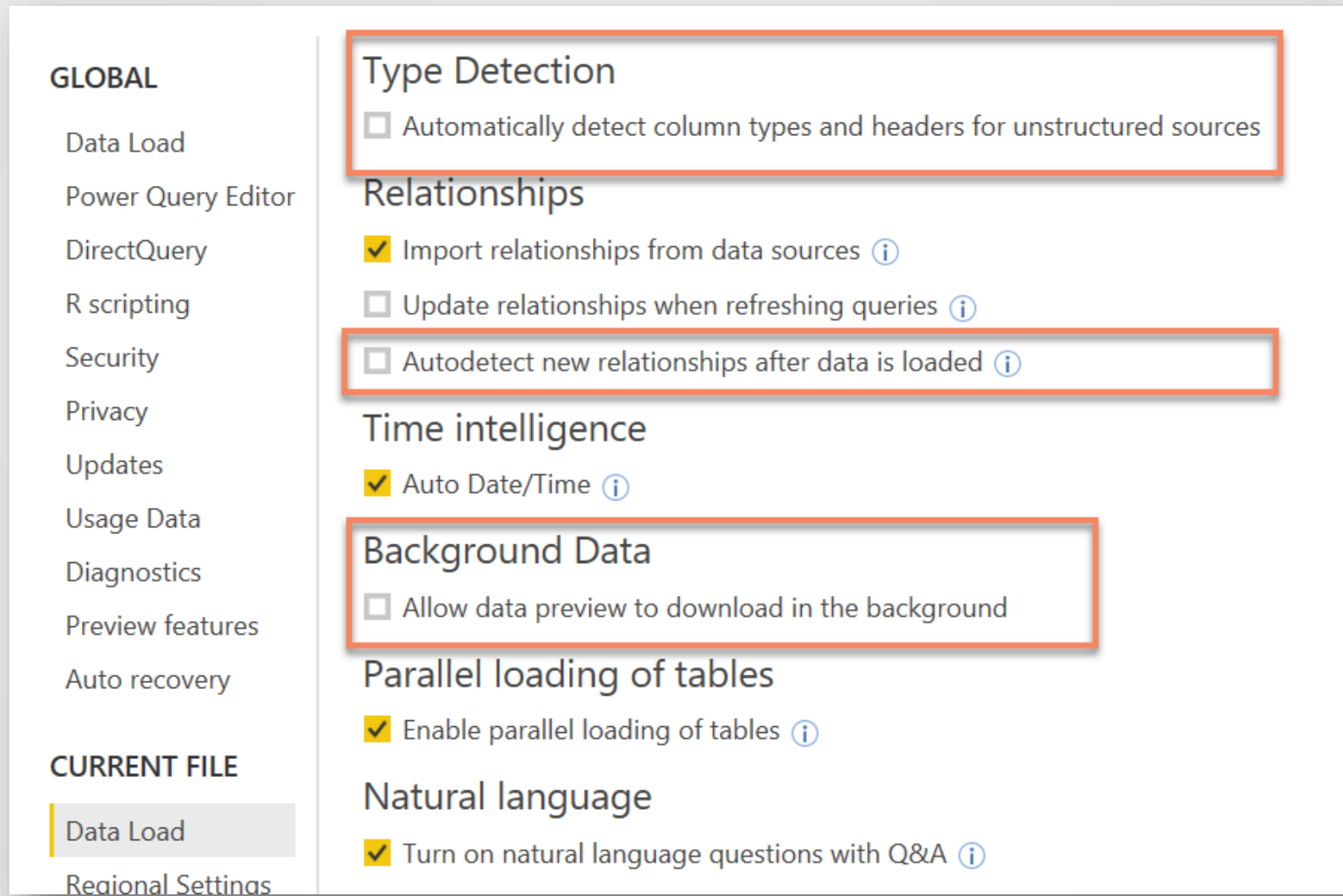
20160101

Server

devscope128\sql2017

Apply Discard

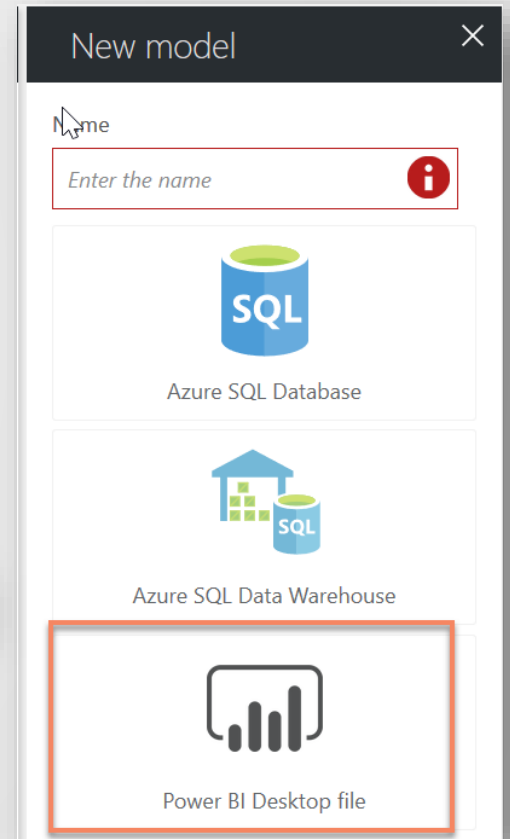
# Tip – Change defaults on Data Load



# Tip – “Grow up” your PBIX

- Why?
  - Need more space (+1GB/file)
  - More control => partitioning, perspectives, translations, scripting,...
  - More DevOps => Source Control
  - Merge multiple Power BI models into singular AS Model
- How?
  1. Using WebDesigner in Azure Portal
  2. Using [PowerBIPS.Tools](#) - *Convert-PowerBIToASTabular*

```
Convert-PowerBIDesktopToASTabular -pbiDesktopWindowName "*VanArsdel - Sales*" -outputPath "$currentPath\SSAS"
```



Learn more: [link1](#)



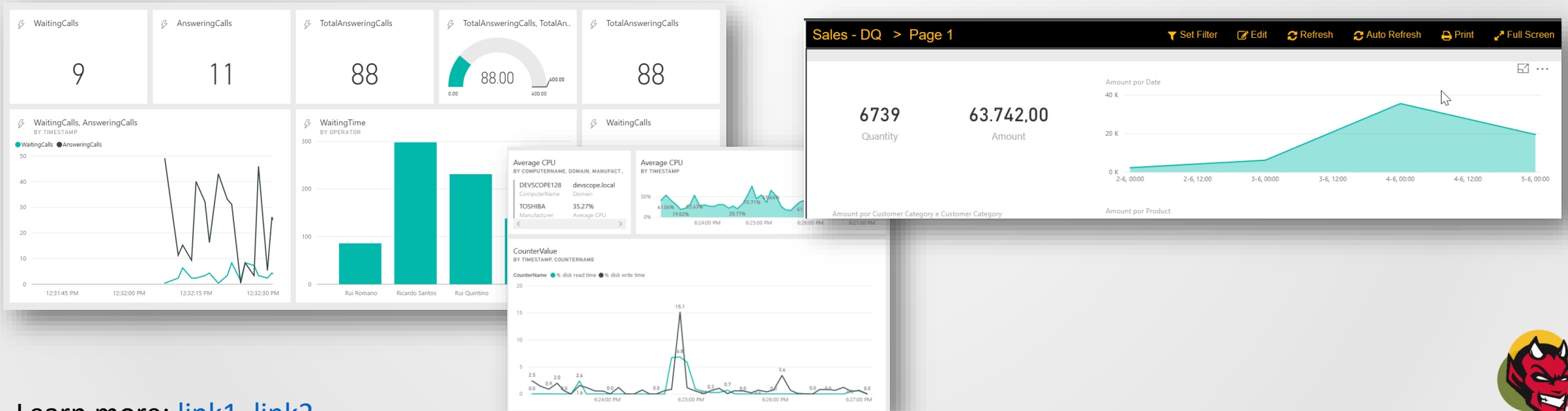
## Tip – Power BI Report Rebind

- After the conversion there could be hundred of existing reports
  - Created by BI Team or End-User
- How?
  - Power BI Desktop
    - Remove all queries => Get-Data => Tabular (live)
  - REST API + [PowerBIPS](#)

```
# Change the dataset for all the reports that reference the SourceDataSetId into the TargetDataSetId  
Get-PBIReport |? datasetId -eq "SourceDataSetId" | Set-PBIReportsDataset -targetDataSetId "TargetDataSetId" -Verbose
```

# Tip – Power BI + Real Time!

- Multiple ways => Choose the best for you!
  1. [Streaming DataSets](#)
  2. [REST API](#)
  3. DirectQuery/Live + [Power BI Embedded](#) ([Ted Pattinson GitHub as sample](#))

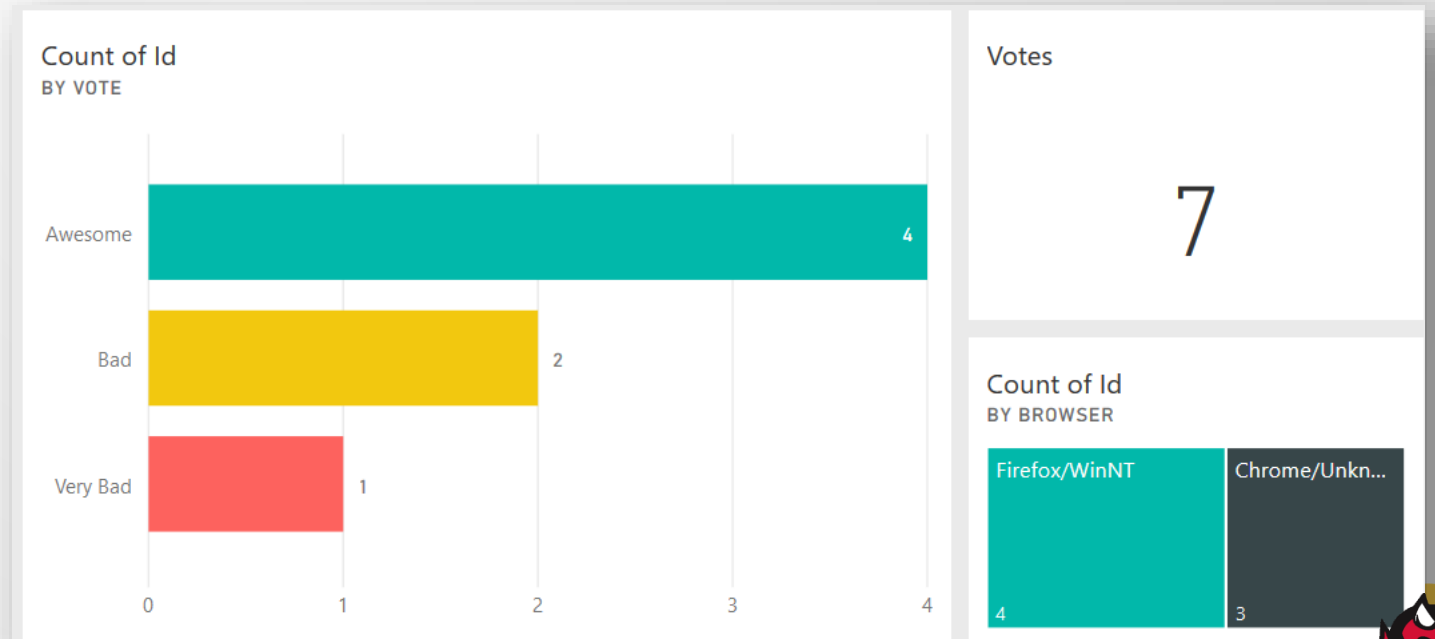
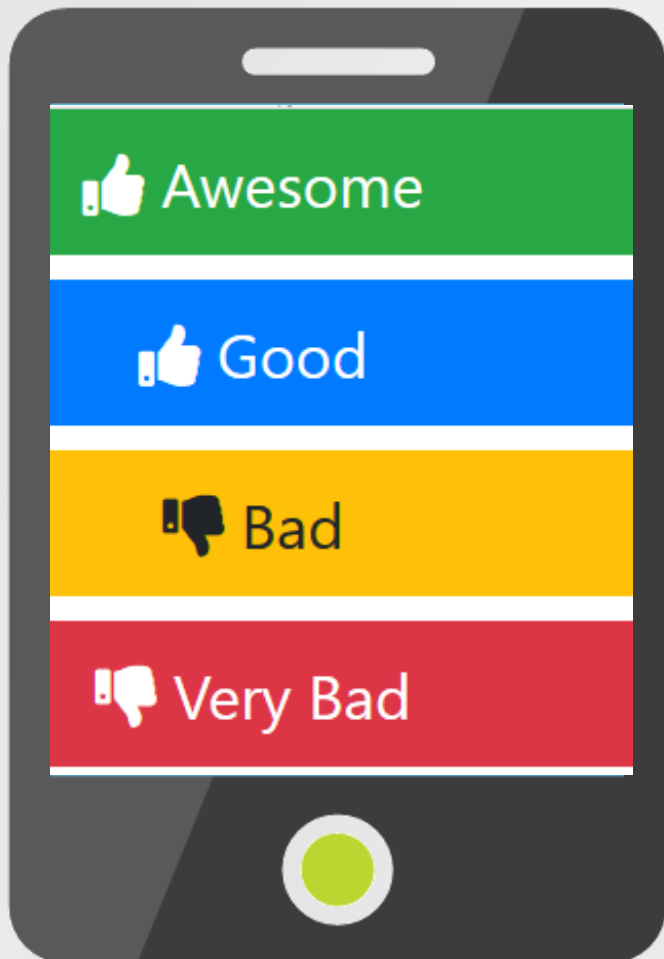


Learn more: [link1](#), [link2](#)



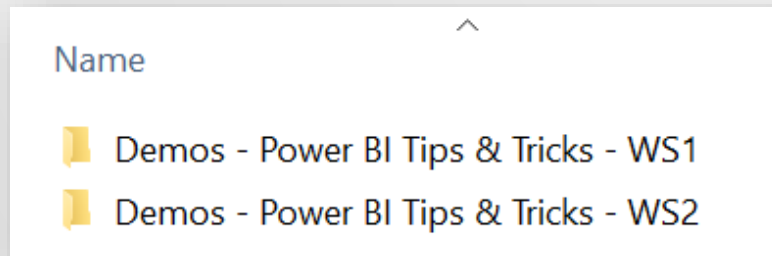
## Tip – Real-Time Session Voting

<https://tinyurl.com/pbivoting>  
<https://bit.ly/2HVi5ej>

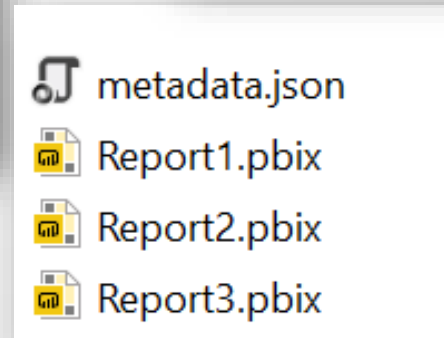


# Tip – Power BI \*DevOps – REST API

- Create Multiple Workspaces from file system
  - Upload pbix automatically
- Sync between Workspaces: (ex: Dev => Prod)
  - Download DataSets & Publish
  - Clone Reports, Dashboards,...



```
{
  users: [
    { emailAddress: "rui.romano@devscope.net"
      , groupUserAccessRight: "Admin" }
    , { emailAddress: "Demo1.PowerBI@DevScope365.onmicrosoft.com"
      , groupUserAccessRight: "Admin" }
  ]
}
```



Learn more: [link1](#)



## Tip – Export Power BI Reports from Workspaces

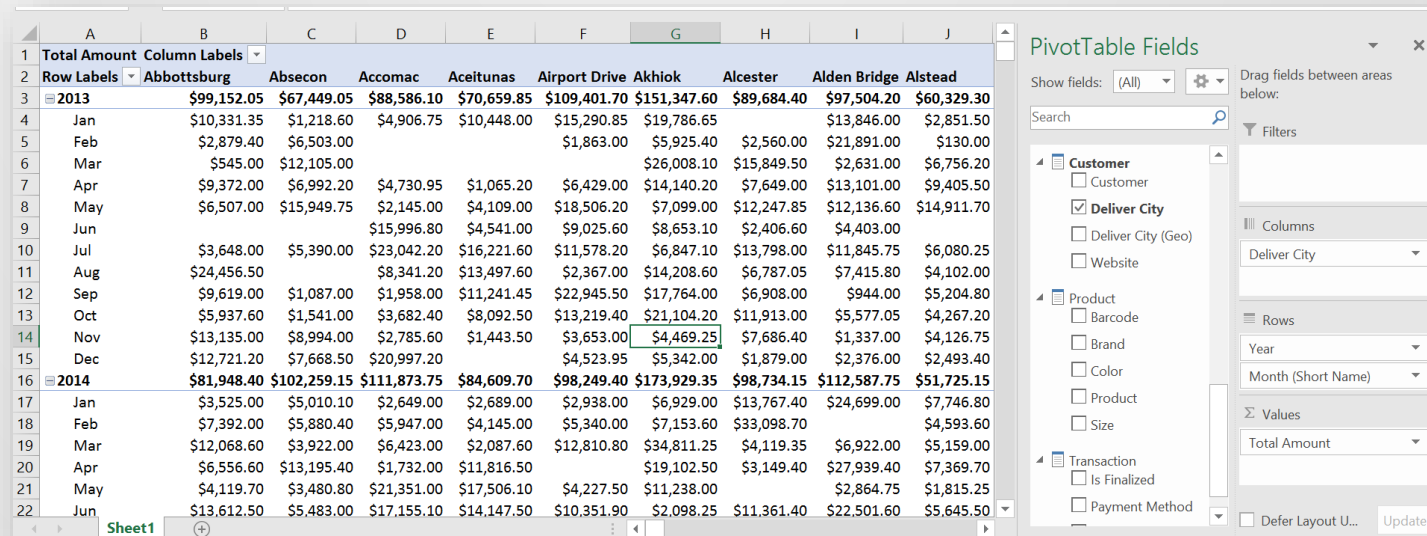
- Easily export all your PBIX
  - Backup?
  - Governance?

```
# Exports all the reports in the workspace
```

```
Get-PBIReport -groupId "GUID" | Export-PBIReport -groupId "GUID" -destinationFolder "$currentPath"
```

# Tip – Explore Power BI Desktop w/ Excel

- PBIDesktop has an Analysis Services Instance
- Discover the TCP Port using netstat, powershell, DaxStudio
- Connect with any OLAP client (Excel, SSMS, PowerBIDesktop...)
- Great for data validation at development time



The screenshot shows an Excel spreadsheet with a PivotTable. The PivotTable is set to show 'Total Amount' by 'Month' and 'Deliver City'. The data is organized by year (2013 and 2014) and month (Jan through Jun). The locations included are Abbottsburg, Absecon, Accomac, Aceltunas, Airport Drive, Akhiok, Alcester, Alden Bridge, and Alstead. The PivotTable Fields task pane on the right shows the following configuration:

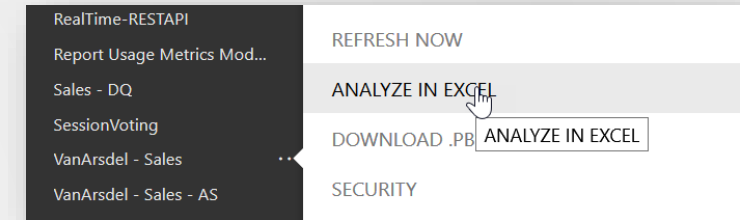
- Show fields:** (All)
- Filters:** (Empty)
- Columns:** Deliver City
- Rows:** Year, Month (Short Name)
- Values:** Total Amount

The data in the PivotTable is as follows:

Year	Month	Abbottsburg	Absecon	Accomac	Aceltunas	Airport Drive	Akhiok	Alcester	Alden Bridge	Alstead
2013	Jan	\$10,331.35	\$1,218.60	\$4,906.75	\$10,448.00	\$15,290.85	\$19,786.65	\$13,846.00	\$2,851.50	
	Feb	\$2,879.40	\$6,503.00			\$1,863.00	\$5,925.40	\$2,560.00	\$21,891.00	\$130.00
	Mar	\$545.00	\$12,105.00				\$26,008.10	\$15,849.50	\$2,631.00	\$6,756.20
	Apr	\$9,372.00	\$6,992.20	\$4,730.95	\$1,065.20	\$6,429.00	\$14,140.20	\$7,649.00	\$13,101.00	\$9,405.50
	May	\$6,507.00	\$15,949.75	\$2,145.00	\$4,109.00	\$18,506.20	\$7,099.00	\$12,247.85	\$12,136.60	\$14,911.70
	Jun			\$15,996.80	\$4,541.00	\$9,025.60	\$8,653.10	\$2,406.60	\$4,403.00	
2014	Jul	\$3,648.00	\$5,390.00	\$23,042.20	\$16,221.60	\$11,578.20	\$6,847.10	\$13,798.00	\$11,845.75	\$6,080.25
	Aug	\$24,456.50		\$8,341.20	\$13,497.60	\$2,367.00	\$14,208.60	\$6,787.05	\$7,415.80	\$4,102.00
	Sep	\$9,619.00	\$1,087.00	\$1,958.00	\$11,241.45	\$22,945.50	\$17,764.00	\$6,908.00	\$944.00	\$5,204.80
	Oct	\$5,937.60	\$1,541.00	\$3,682.40	\$8,092.50	\$13,219.40	\$21,104.20	\$11,913.00	\$5,577.05	\$4,267.20
	Nov	\$13,135.00	\$8,994.00	\$2,785.60	\$1,443.50	\$3,653.00	\$4,469.25	\$7,686.40	\$1,337.00	\$4,126.75
	Dec	\$12,721.20	\$7,668.50	\$20,997.20		\$4,523.95	\$5,342.00	\$1,879.00	\$2,376.00	\$2,493.40

# Tip – Get Data from PowerBI.com

- **Not Supported! But it works 😊**
- Get the connection string from “Analyse in Excel”
- Remove the “ClaimsToken”
- Use “Get-Data” from OLEDB w/ DAX query
- Only works w/ Personal Gateway 😞



```
Provider=MSOLAP;Integrated Security=ClaimsToken;Data Source=https://analysis.windows.net/powerbi/api;;Initial Catalog=164af183-2454-4f45-964a-c200f51bcd59;Location=https://wabi-north-europe-1.redirect.analysis.windows.net/xmla?vs=sobe_wowvirtualserver-164af183-2454-4f45-964a-c200f51bcd59;MDX Compatibility= 1; MDX Missing Member Error= Error; Security Options= 2; Update Isolation Level= 2; Locale Identifier= 1033
```

## From OLE DB

Connection string (non-credential properties) ⓘ

Provider=MSOLAP;Data Source=https://analysis.windows.net/powerbi/api;;Initial Catalog=164af183-2454-4f45-964a-c200f51bcd59;Location=https://wabi-north-europe-1.redirect.analysis.windows.net/xmla?vs=sobe\_wowvirtualserver-164af183-2454-4f45-964a-c200f51bcd59;MDX Compatibility= 1; MDX Missing Member Error= Error; Security Options= 2; Update Isolation Level= 2; Locale Identifier= 1033

Build

Advanced options

SQL statement (optional)

Evaluate SUMMARIZE('Product', [ProductID], [Product], [Category], "Sales", [Total Sales])

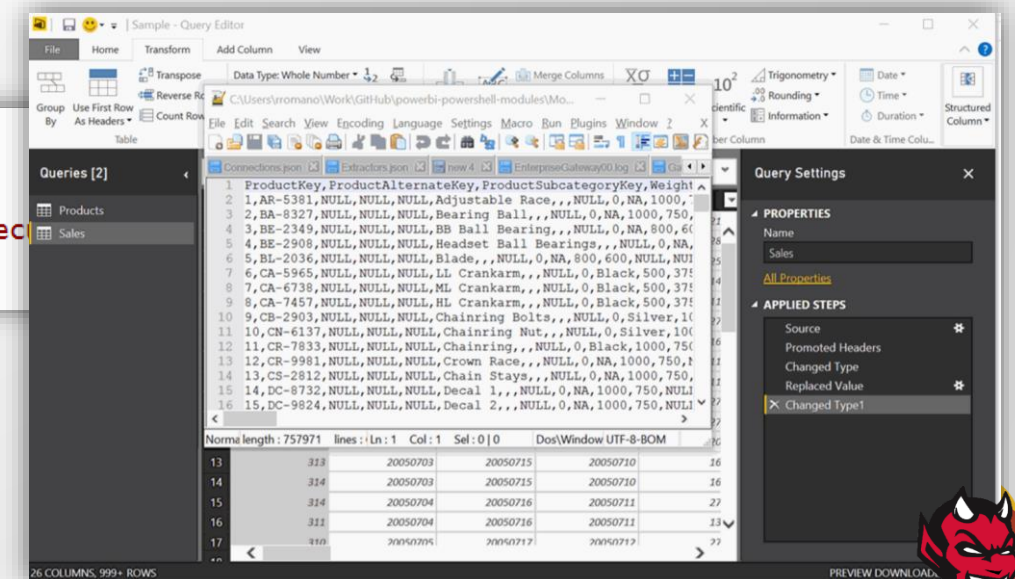


# Tip – Export Data from Power BI Desktop

- Export to CSV / SQL Server
- Very handy for one-time-only scenarios
  - ex: Data Science data wrangling
- \*one-time-only scenarios

```
Import-Module PowerBIETL
```

```
Export-PBIDesktopToSQL -pbiDesktopWindowName "*PBIETL.Sample*" -  
-sqlConnStr "Data Source=.\SQL2016; Initial Catalog=Dummy; Integrated Security=SSPI;" -  
-sqlSchema "csi" -verbose
```



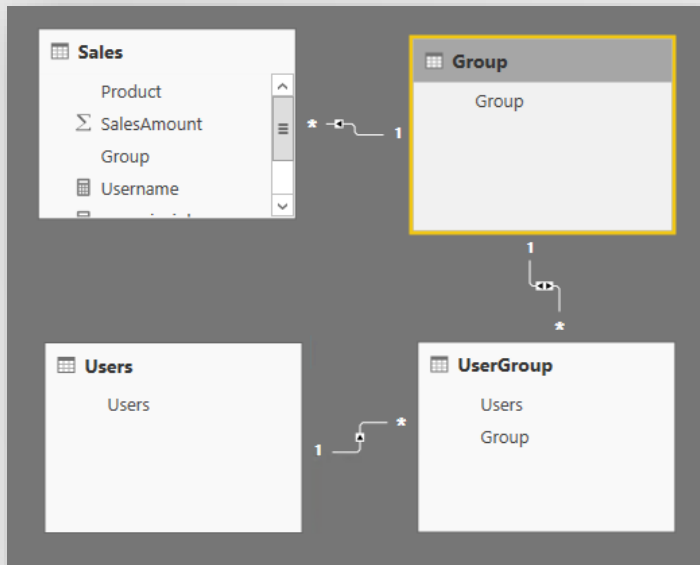
Learn more: [link1](#)



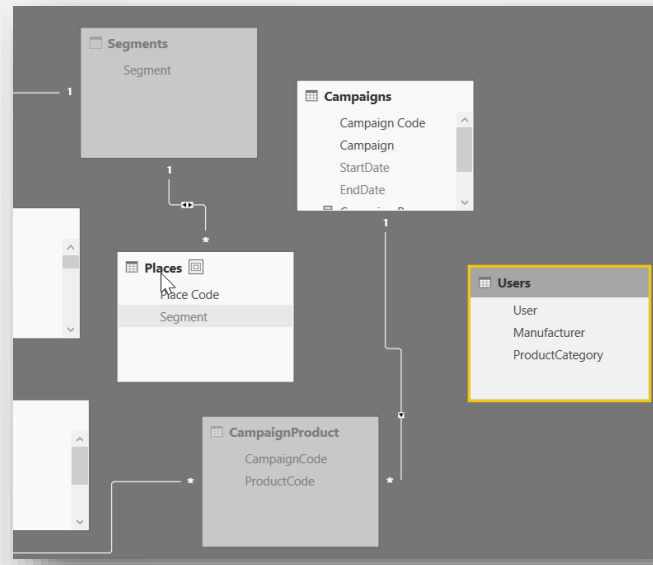
# Tip – Dynamic Security

- Evaluate your scenario, probably the basic approach is enough
- Simple to manage
  - Versus standard security model with relationships
- Don't work w/ DirectQuery

Standard Security Model



Lookup Security Model



Users Table

User	Manufacturer	ProductCategory
admin@vanarsdel.com	ALL	ALL
user1@vanarsdel.com	Abbas Leo	ALL
user2@vanarsdel.com	ALL	Rural Urban
user3@vanarsdel.com	VanArsdel	Rural Urban Mix

DAX Expression in the Roles

Table filter DAX expression

```
VAR LV = LOOKUPVALUE(Users[Manufacturer], Users[User],
  USERNAME())

RETURN PATHCONTAINS(LV, [Manufacturer]) || LV = "ALL"
```





PLEASE FILL IN THE  
EVALUATION FORM.

YOUR OPINION IS  
**IMPORTANT!**

AT THE ENTRANCE AFTER THE LAST SESSION OF THE DAY



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